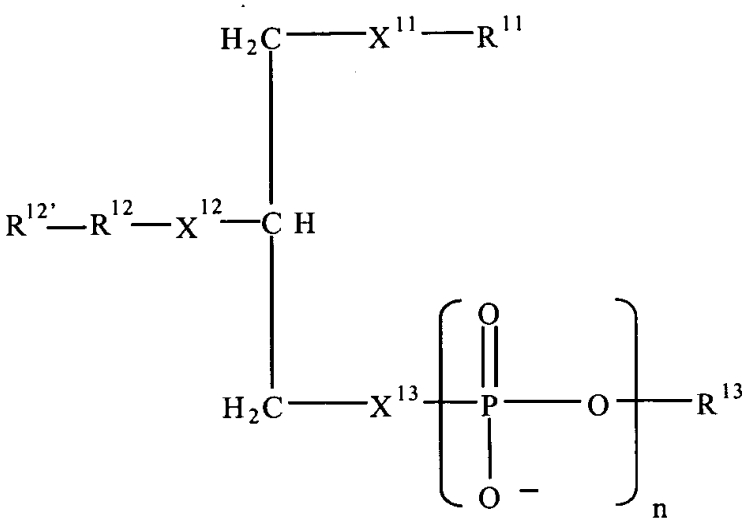
CLAIMS

What is claimed is:

1. A compound having the structure of Formula III:



(III)

wherein,

R^{11} is (C_1-C_{16}) alkyl, branched alkyl, alkenyl or alkynyl;

R^{12} is (C_1-C_{16}) alkyl, branched alkyl, alkenyl or alkynyl;

$R^{12'}$ is (C_1-C_{16}) alkyl, branched alkyl, alkenyl, alkynyl, aryl, phenalkyl, or alkoxy or hydroxy, anhydride, or hydrogen, with the proviso that when $R^{12'}$ is not hydroxy, it is optionally linked to X^{12} through a linker moiety L and wherein $R^{12'}$ is optionally terminally substituted with a therapeutic agent, wherein

L is -O-, -S-, $-NH_2$-, or -NHC(O)-;

X^{11} is -O-, -S-, $-NH_2$-, or -NHC(O)-;

X^{12} is -O-, -S-, $-NH_2$-, or -NHC(O)-;

X^{13} is -O-, -S-, $-CH_2$-, anhydride, or (C_1-C_{16}) alkoxy;

n is 0, 1 or 2;

R^{13} is a therapeutic agent or $-R^3N(R^6)(R^7)R^8$;

R^3 is (C_1-C_8) alkylene; and

R^6, R^7 and R^8 are each independently -H, (C_1-C_8) alkyl or (C_1-C_8) alkoxy;

and pharmaceutically acceptable salts and prodrugs thereof.

2. The compound of claim 1 wherein

R^{12} is (C_8-C_{12}) alkyl, branched alkyl, alkenyl or alkynyl;

$R^{12'}$ is (C_1-C_{16}) phenalkyl or alkoxy or hydroxy or anhydride, with the proviso that when $R^{12'}$ is not hydroxy, it is optionally linked to X^{12} through an ether oxygen;

R^{13} is $-R^3N(R^6)(R^7)R^8$; and

X^{12} is -O-.

3. The compound of claim 2 wherein $R^{12'}$ is terminally substituted with a therapeutic agent.

4. The compound of claim 2 wherein $R^{12'}$ is $-OCH_2C_6H_5$, -OH, or $-O_2CCH_2CO_2H$, and wherein $R^{12'}$ is optionally terminally substituted with a therapeutic agent.

5. The compound of claim 4 wherein $R^{12'}$ is $-O_2CCH_2CO_2-$ and wherein $R^{12'}$ is terminally substituted with a therapeutic agent.

6. The compound of claim 5 wherein the therapeutic agent comprises an agent selected from the group consisting of an antiviral agent and an anticancer agent.

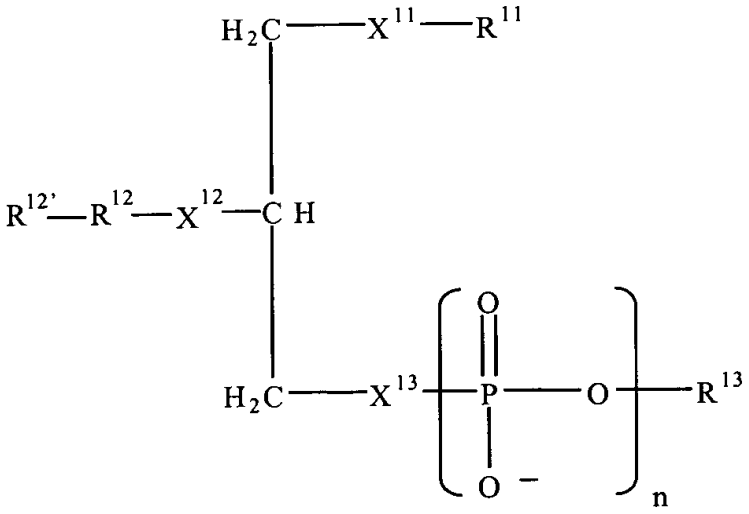
7. The compound of claim 6 wherein the therapeutic agent comprises

an agent selected from the group consisting of a protease inhibitor, a polymerase inhibitor, a reverse transcriptase inhibitor, and a nucleoside analogue.

8. The compound of claim 6 wherein the antiviral agent is AZT.

9. The compound of claim 6 wherein the anticancer agent is an agent selected from the group consisting of gemcitabine, ara-C, 5-azacytidine, cladribine, fluclarabine, fluorodeoxyuridine, cytosine arabinoside, and 6-mercaptopurine.

10. A compound having the structure of Formula III:



(III)

wherein,

R^{11} is (C_1-C_{16}) alkyl, branched alkyl, alkenyl or alkynyl;

R^{12} is (C_1-C_{16}) alkyl, branched alkyl, alkenyl or alkynyl;

$R^{12'}$ is (C_1-C_{16}) phenalkyl or alkoxy or anhydride or hydroxy, with the proviso that when $R^{12'}$ is not hydroxy, it is linked to X^{12} through an ether oxygen and wherein $R^{12'}$ is terminally substituted with a therapeutic agent;

X^{11} -S-;

X^{12} is -O-;

X^{13} is -O-;

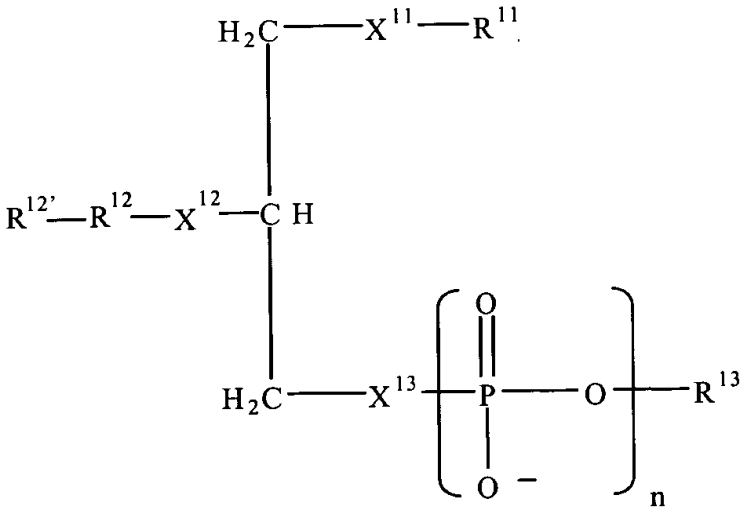
R^{13} is $-R^3N(R^6)(R^7)R^8$;

R^3 is $-CH_2CH_2-$; and

R^6, R^7 and R^8 are each independently methyl;

and pharmaceutically acceptable salts and prodrugs thereof.

11. A compound having the structure of Formula III:



(III)

wherein,

R^{11} is $-C_{12}H_{25}$;

R^{12} is $-(CH_2)_8$;

$R^{12'}$ is $-O_2CCH_2CO_2AZT$;

X^{11} -S-;

X^{12} is -O-;

X^{13} is -O-;

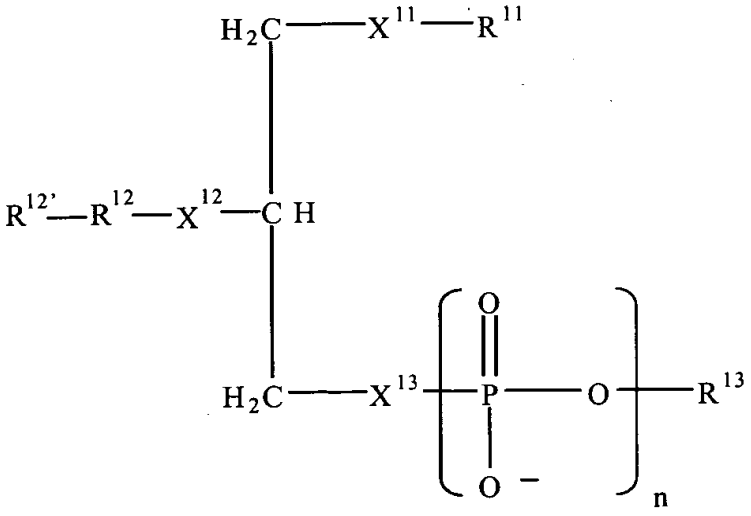
R^{13} is $-R^3N(R^6)(R^7)R^8$;

R^3 is $-CH_2CH_2-$; and

R^6, R^7 and R^8 are each independently methyl;

and pharmaceutically acceptable salts and prodrugs thereof.

12. A compound having the structure of Formula III:



(III)

wherein,

R^{11} is $-C_{12}H_{25}$;

R^{12} is $-(CH_2)_{10}$;

$R^{12'}$ is $-O_2CCH_2CO_2AZT$;

X^{11} -S-;

X^{12} is -O-;

X^{13} is -O-;

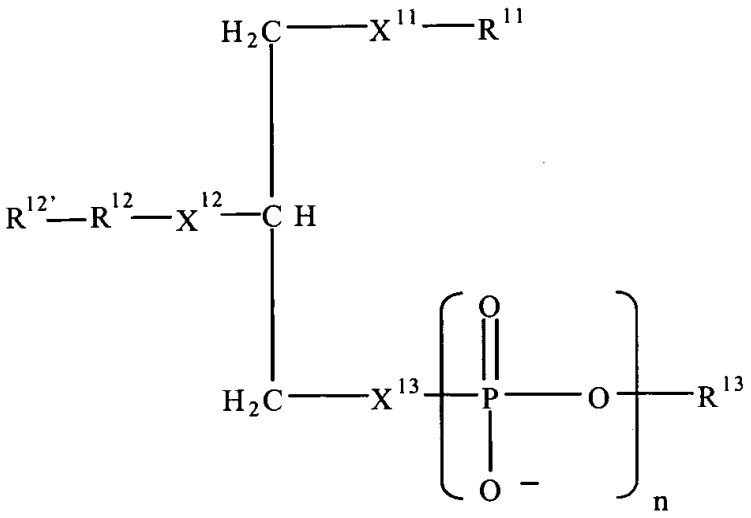
R^{13} is $-R^3N(R^6)(R^7)R^8$;

R^3 is $-CH_2CH_2-$; and

R^6, R^7 and R^8 are each independently methyl;

and pharmaceutically acceptable salts and prodrugs thereof.

13. A compound having the structure of Formula III:



(III)

wherein,

R^{11} is $-C_{12}H_{25}$;

R^{12} is $-(CH_2)_{12}$;

$R^{12'}$ is $-O_2CCH_2CO_2AZT$;

X^{11} -S-;

X^{12} is -O-;

X^{13} is -O-;

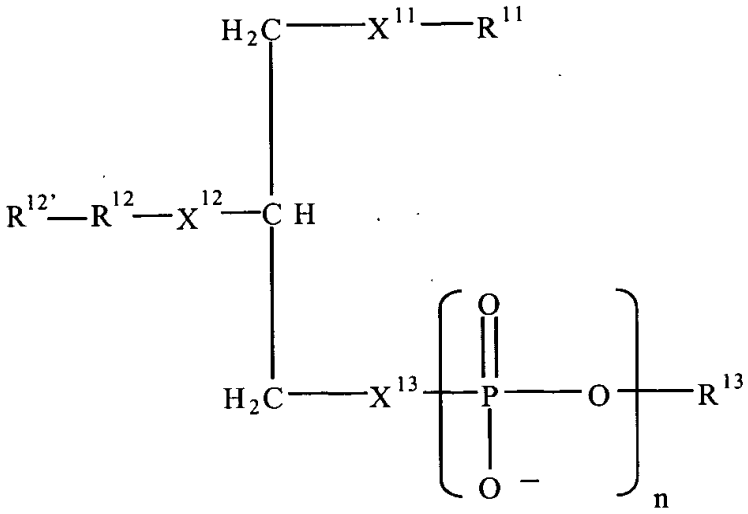
R^{13} is $-R^3N(R^6)(R^7)R^8$;

R^3 is $-CH_2CH_2-$; and

R^6, R^7 and R^8 are each independently methyl;

and pharmaceutically acceptable salts and prodrugs thereof.

14. A method of treating a virus infection in a mammal comprising administering to the mammal, in an amount effective to treat the infection, a compound, or a pharmaceutically acceptable salt or a prodrug thereof, having the structure of Formula III:



(III)

wherein,

R^{11} is (C_1-C_{16}) alkyl, branched alkyl, alkenyl or alkynyl;

R^{12} is (C_1-C_{16}) alkyl, branched alkyl, alkenyl or alkynyl;

$R^{12'}$ is (C_1-C_{16}) alkyl, branched alkyl, alkenyl, alkynyl, aryl, phenalkyl, or alkoxy or hydroxy, anhydride, or hydrogen, with the proviso that when $R^{12'}$ is not hydroxy, it is optionally linked to X^{12} through a linker moiety L and wherein $R^{12'}$ is optionally terminally substituted with a therapeutic agent, wherein

L is -O-, -S-, -NH_2-, or -NHC(O)-;

X^{11} is -O-, -S-, -NH_2-, or -NHC(O)-;

X^{12} is -O-, -S-, -NH_2-, or -NHC(O)-;

X^{13} is -O-, -S-, -CH_2-, anhydride, or (C_1-C_{16}) alkoxy;

n is 0, 1 or 2;

R^{13} is a therapeutic agent or $-R^3N(R^6)(R^7)R^8$;

R^3 is (C_1-C_8) alkylene; and

R^6, R^7 and R^8 are each independently -H, (C_1-C_8) alkyl or (C_1-C_8) alkoxy.

15. The method of claim 14 wherein the virus infection is an infection by a virus selected from the group consisting of HIV, hepatitis virus, and herpes virus.

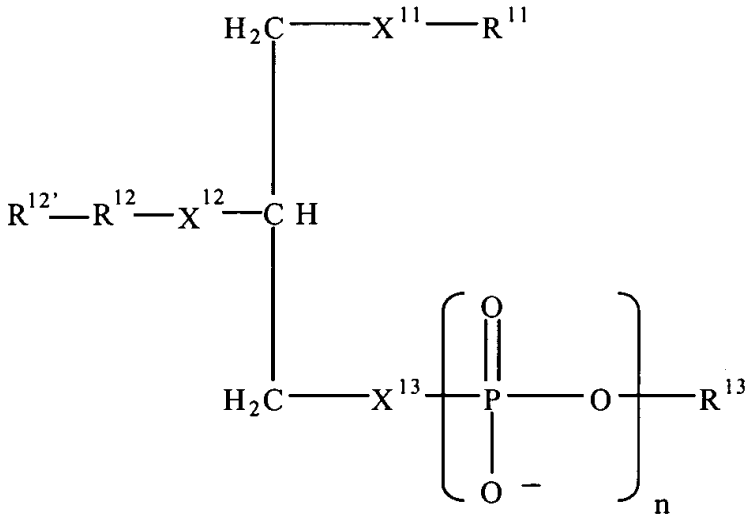
16. The method of claim 15 wherein the HIV is selected from the group consisting of HIV-1 and HIV-2.

17. The method of claim 15 wherein the virus is selected from the group consisting of hepatitis A, hepatitis B, hepatitis C, hepatitis D, hepatitis E, and hepatitis G viruses.

18. The method of claim 15 wherein the virus is selected from the group consisting of herpes simplex virus type 1, herpes simplex virus type 2, varicella-zoster virus, cytomegalovirus, rhinovirus, Epstein Barr virus, human herpes virus type 6 human herpes virus type 7, and human herpes virus type 8.

19. The method of claim 14 wherein the mammal is a human.

20. A method of inhibiting virus replication in a cell comprising administering to the cell, in an amount effective to inhibit virus replication in the cell, a compound, or a pharmaceutically acceptable salt or a prodrug thereof, having the structure of Formula III:



(III)

wherein,

R^{11} is (C_1-C_{16}) alkyl, branched alkyl, alkenyl or alkynyl;

R^{12} is (C_1-C_{16}) alkyl, branched alkyl, alkenyl or alkynyl;

$R^{12'}$ is (C_1-C_{16}) alkyl, branched alkyl, alkenyl, alkynyl, aryl, phenalkyl, or alkoxy or hydroxy, anhydride, or hydrogen, with the proviso that when $R^{12'}$ is not hydroxy, it is optionally linked to X^{12} through a linker moiety L and wherein $R^{12'}$ is optionally terminally substituted with a therapeutic agent, wherein

L is -O-, -S-, $-NH_2$-, or -NHC(O)-;

X^{11} is -O-, -S-, $-NH_2$-, or -NHC(O)-;

X^{12} is -O-, -S-, $-NH_2$-, or -NHC(O)-;

X^{13} is -O-, -S-, $-CH_2$-, anhydride, or (C_1-C_{16}) alkoxy;

n is 0, 1 or 2;

R^{13} is a therapeutic agent or $-R^3N(R^6)(R^7)R^8$;

R^3 is (C_1-C_8) alkylene; and

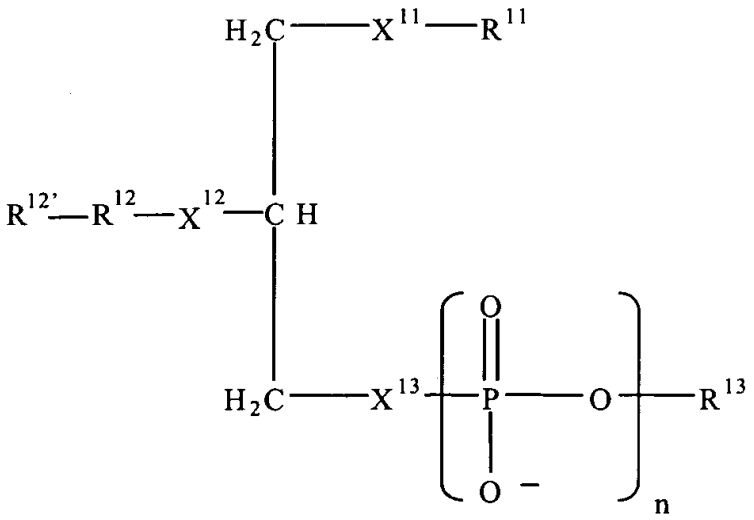
R^6, R^7 and R^8 are each independently -H, (C_1-C_8) alkyl or (C_1-C_8) alkoxy.

21. The method of claim 20 wherein the cell is a mammalian cell.

22. The compound of claim 21 wherein the mammalian cell is a cell selected from the group consisting of a CNS cell and a lymphoid cell.

23. The compound of claim 21 wherein the mammalian cell is a cell selected from the group consisting of an astrocyte or a glial cell.

24. A method of combating a cancer in a mammal comprising administering to the mammal, in an amount effective to combat a cancer in the mammal, a compound, or a pharmaceutically acceptable salt or a prodrug thereof, having the structure of Formula III:



(III)

wherein,

R^{11} is (C_1-C_{16}) alkyl, branched alkyl, alkenyl or alkynyl;

R^{12} is (C_1-C_{16}) alkyl, branched alkyl, alkenyl or alkynyl;

$R^{12'}$ is (C_1-C_{16}) alkyl, branched alkyl, alkenyl, alkynyl, aryl, phenalkyl,

or alkoxy or hydroxy, anhydride, or hydrogen, with the proviso that when $R^{12'}$ is not hydroxy, it is optionally linked to X^{12} through a linker moiety L and wherein $R^{12'}$ is optionally terminally substituted with a therapeutic agent, wherein

L is -O-, -S-, $-NH_2-$, or -NHC(O)-;

X^{11} is -O-, -S-, $-NH_2-$, or -NHC(O)-;

X^{12} is -O-, -S-, $-NH_2-$, or -NHC(O)-;

X^{13} is -O-, -S-, $-CH_2-$, anhydride, or (C_1-C_{16}) alkoxy;

n is 0, 1 or 2;

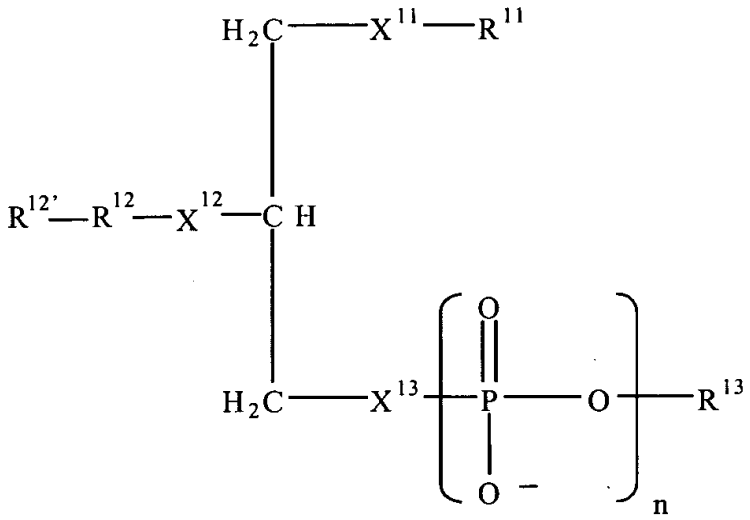
R^{13} is a therapeutic agent or $-R^3N(R^6)(R^7)R^8$;

R^3 is (C_1-C_8) alkylene; and

R^6, R^7 and R^8 are each independently -H, (C_1-C_8) alkyl or (C_1-C_8) alkoxy.

25. The method of claim 24, wherein said cancer is a cancer selected from the group consisting of a carcinoma, a sarcoma, a neuroblastoma, a leukemia, a lymphoma and a solid tumor.

26. A method of treating a disease in a mammal comprising administering to the mammal, in an amount effective to treat the disease, a compound, or a pharmaceutically acceptable salt or a prodrug thereof, having the structure of Formula III:



(III)

wherein,

R^{11} is (C_1-C_{16}) alkyl, branched alkyl, alkenyl or alkynyl;

R^{12} is (C_1-C_{16}) alkyl, branched alkyl, alkenyl or alkynyl;

$R^{12'}$ is (C_1-C_{16}) alkyl, branched alkyl, alkenyl, alkynyl, aryl, phenalkyl, or alkoxy or hydroxy, anhydride, or hydrogen, with the proviso that when $R^{12'}$ is not hydroxy, it is optionally linked to X^{12} through a linker moiety L and wherein $R^{12'}$ is optionally terminally substituted with a therapeutic agent, wherein

L is -O-, -S-, -NH_2-, or -NHC(O)-;

X^{11} is -O-, -S-, -NH_2-, or -NHC(O)-;

X^{12} is -O-, -S-, -NH_2-, or -NHC(O)-;

X^{13} is -O-, -S-, -CH_2-, anhydride, or (C_1-C_{16}) alkoxy;

n is 0, 1 or 2;

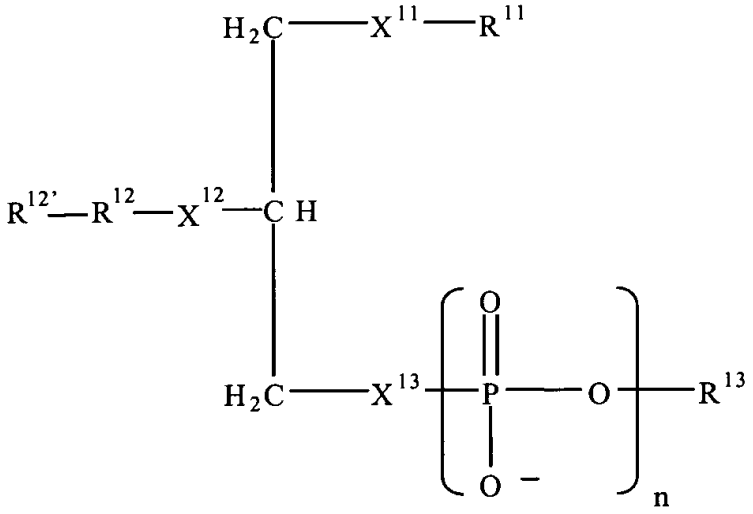
R^{13} is a therapeutic agent or -$R^3N(R^6)(R^7)R^8$;

R^3 is (C_1-C_8) alkylene; and

R^6, R^7 and R^8 are each independently -H, (C_1-C_8) alkyl or (C_1-C_8) alkoxy.

27. The method of claim 26, wherein the disease is a disease selected from the group consisting of a brain disease, a CNS disease, a lymphatic system disease, a reproductive system disease, a cardiovascular disease, a kidney disease and a liver disease.

28. A pharmaceutical composition comprising a compound and a pharmaceutically acceptable carrier, the compound having the structure of Formula III:



(III)

wherein,

R^{11} is (C_1-C_{16}) alkyl, branched alkyl, alkenyl or alkynyl;

R^{12} is (C_1-C_{16}) alkyl, branched alkyl, alkenyl or alkynyl;

$R^{12'}$ is (C_1-C_{16}) alkyl, branched alkyl, alkenyl, alkynyl, aryl, phenalkyl, or alkoxy or hydroxy, anhydride, or hydrogen, with the proviso that when $R^{12'}$ is not hydroxy, it is optionally linked to X^{12} through a linker moiety L and wherein $R^{12'}$ is optionally terminally substituted with a therapeutic agent, wherein

L is -O-, -S-, -NH_2-, or -NHC(O)-;

X^{11} is -O-, -S-, -NH_2-, or -NHC(O)-;

X^{12} is -O-, -S-, -NH_2-, or -NHC(O)-;

X^{13} is -O-, -S-, -CH_2-, anhydride, or (C_1-C_{16}) alkoxy;

n is 0, 1 or 2;

R^{13} is a therapeutic agent or -$R^3N(R^6)(R^7)R^8$;

R^3 is (C_1-C_8) alkylene; and

R^6, R^7 and R^8 are each independently -H, (C_1-C_8) alkyl or (C_1-C_8) alkoxy;

and pharmaceutically acceptable salts and prodrugs thereof.

29. The pharmaceutical composition of claim 28 wherein

R^{12} is (C_8-C_{12}) alkyl, branched alkyl, alkenyl or alkynyl;

$R^{12'}$ is (C_1-C_{16}) phenalkyl or alkoxy or hydroxy or anhydride, with the proviso that when $R^{12'}$ is not hydroxy, it is optionally linked to X^{12} through an ether oxygen;

R^{13} is -$R^3N(R^6)(R^7)R^8$; and

X^{12} is -O-.

30. The pharmaceutical composition of claim 29 wherein $R^{12'}$ is terminally substituted with a therapeutic agent.

31. The pharmaceutical composition of claim 29 wherein $R^{12'}$ is -$OCH_2C_6H_5$, -OH, or -$O_2CCH_2CO_2H$, and wherein $R^{12'}$ is optionally terminally substituted with a therapeutic agent.

32. The pharmaceutical composition of claim 31 wherein $R^{12'}$ is -$O_2CCH_2CO_2$- and wherein $R^{12'}$ is terminally substituted with a therapeutic agent.

33. The pharmaceutical composition of claim 32 wherein the

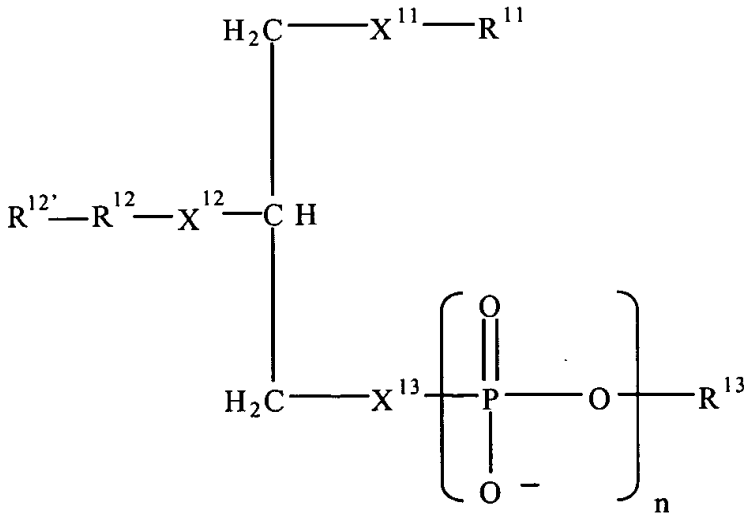
therapeutic agent comprises an agent selected from the group consisting of an antiviral agent and an anticancer agent.

34. The pharmaceutical composition of claim 33 wherein the therapeutic agent comprises an agent selected from the group consisting of a protease inhibitor, a polymerase inhibitor, a reverse transcriptase, and a nucleoside analogue.

35. The pharmaceutical composition of claim 33 wherein the antiviral agent is AZT.

36. The pharmaceutical composition of claim 33 wherein the anticancer agent is an agent selected from the group consisting of gemcitabine, ara-C, 5-azacytidine, cladribine, fluclarabine, fluorodeoxyuridine, cytosine arabinoside, and 6-mercaptopurine.

37. A pharmaceutical composition comprising a compound and a pharmaceutically acceptable carrier, the compound having the structure of Formula III:



(III)

wherein,

R^{11} is (C_1-C_{16}) alkyl, branched alkyl, alkenyl or alkynyl;

R^{12} is (C_1-C_{16}) alkyl, branched alkyl, alkenyl or alkynyl;

$R^{12'}$ is (C_1-C_{16}) phenalkyl or alkoxy or anhydride or hydroxy, with the proviso that when $R^{12'}$ is not hydroxy, it is linked to X^{12} through an ether oxygen and wherein $R^{12'}$ is terminally substituted with a therapeutic agent;

X^{11} -S-;

X^{12} is -O-;

X^{13} is -O-;

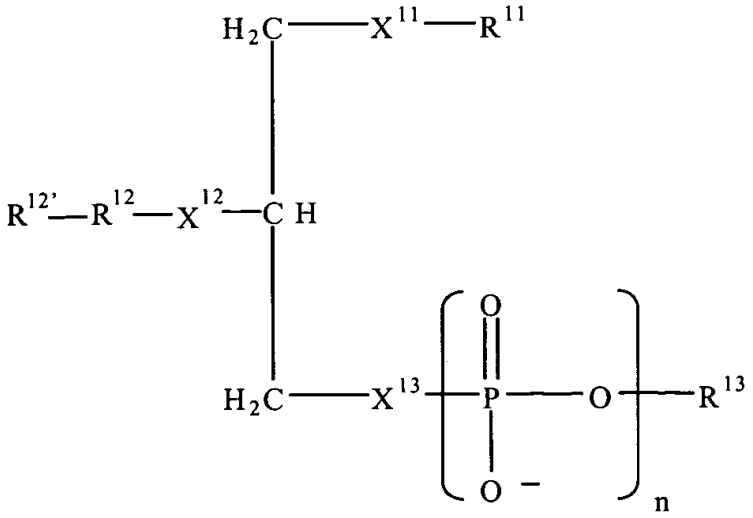
R^{13} is $-R^3N(R^6)(R^7)R^8$;

R^3 is $-CH_2CH_2-$; and

R^6, R^7 and R^8 are each independently methyl;

and pharmaceutically acceptable salts or prodrugs thereof.

38. A pharmaceutical composition comprising a compound and a pharmaceutically acceptable carrier, the compound having the structure of Formula III:



(III)

wherein,

R^{11} is $-C_{12}H_{25}$;

R^{12} is $-(CH_2)_8$;

$R^{12'}$ is $-O_2CCH_2CO_2AZT$;

X^{11} -S-;

X^{12} is -O-;

X^{13} is -O-;

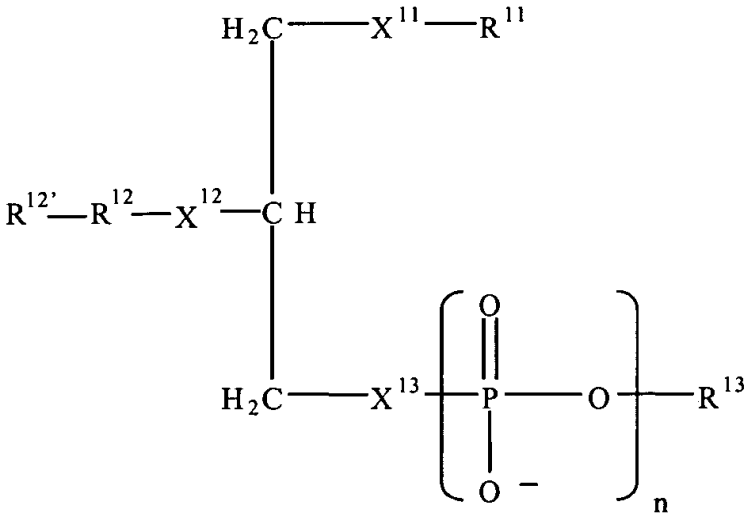
R^{13} is $-R^3N(R^6)(R^7)R^8$;

R^3 is $-CH_2CH_2-$; and

R^6, R^7 and R^8 are each independently methyl;

and pharmaceutically acceptable salts and prodrugs thereof.

39. A pharmaceutical composition comprising a compound and a pharmaceutically acceptable carrier, the compound having the structure of Formula III:



(III)

wherein,

R^{11} is $-C_{12}H_{25}$;

R^{12} is $-(CH_2)_{10}$;

$R^{12'}$ is $-O_2CCH_2CO_2AZT$;

X^{11} -S-;

X^{12} is -O-;

X^{13} is -O-;

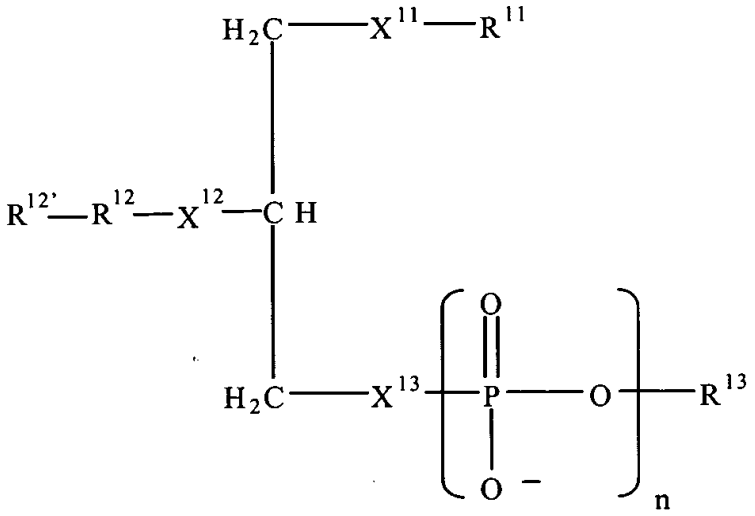
R^{13} is $-R^3N(R^6)(R^7)R^8$;

R^3 is $-CH_2CH_2-$; and

R^6, R^7 and R^8 are each independently methyl;

and pharmaceutically acceptable salts and prodrugs thereof.

40. A pharmaceutical composition comprising a compound and a pharmaceutically acceptable carrier, the compound having the structure of Formula III:



(III)

wherein,

R^{11} is $-C_{12}H_{25}$;

R^{12} is $-(CH_2)_{12}$;

$R^{12'}$ is $-O_2CCH_2CO_2AZT$;

X^{11} -S-;

X^{12} is -O-;

X^{13} is -O-;

R^{13} is $-R^3N(R^6)(R^7)R^8$;

R^3 is $-CH_2CH_2-$; and

R^6, R^7 and R^8 are each independently methyl;

and pharmaceutically acceptable salts and prodrugs thereof.